

# **BISON OIL & GAS II, LLC**

**WELD COUNTY, COLORADO (NAD 83)**

**SW NW SEC. 22 T8N R60W 6th P.M.**

**HALE 8-60 22-23-5**

**ORIGINAL WELLBORE**

**30 May, 2019**

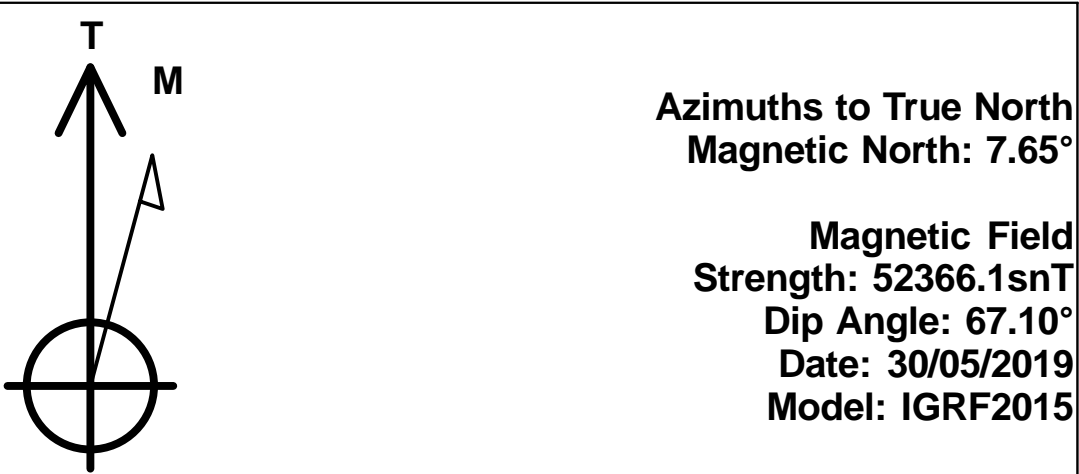
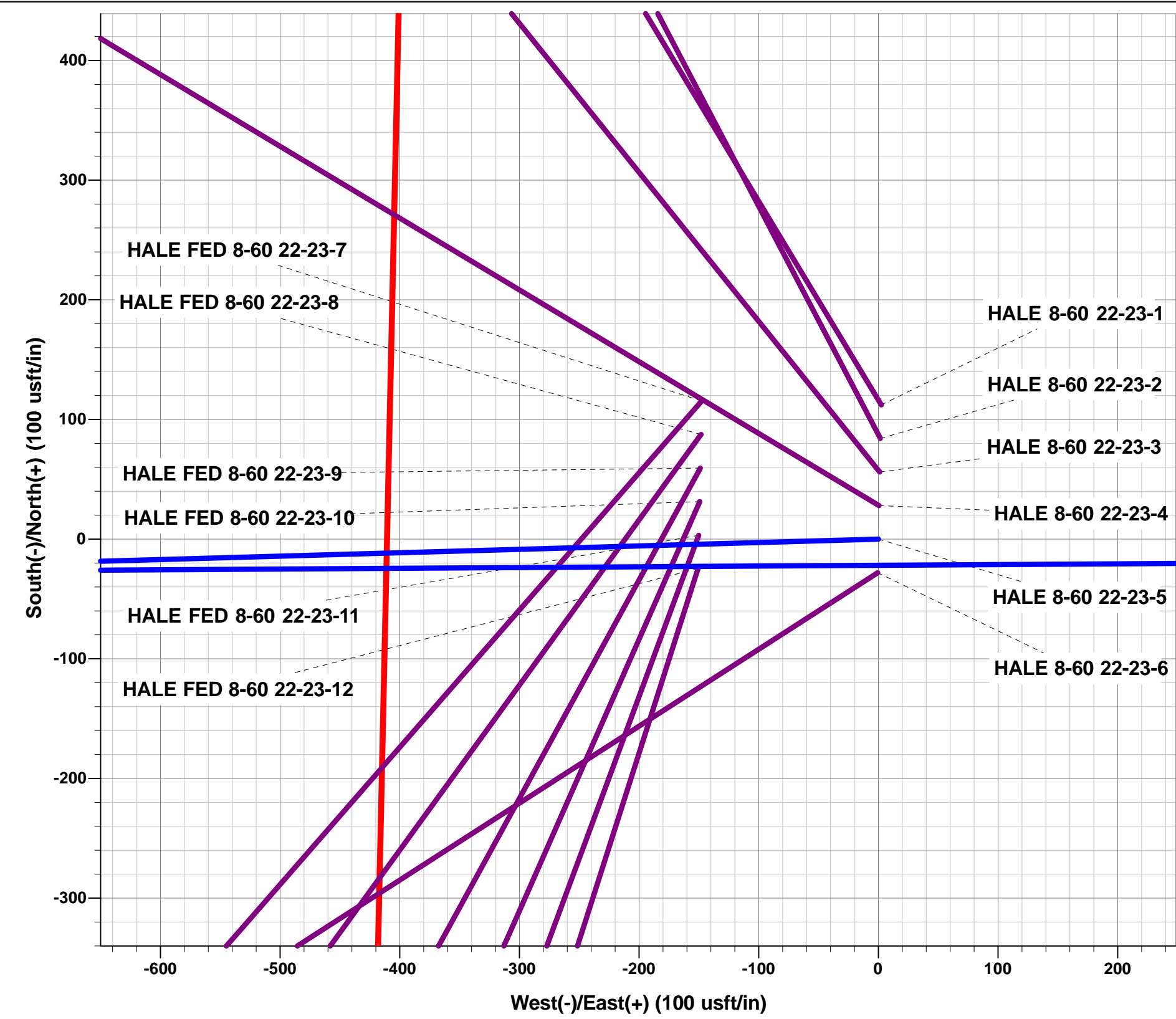
**Plan: PROPOSAL #3**



Project: WELD COUNTY, COLORADO (NAD 83)  
Site: SW NW SEC. 22 T8N R60W 6th P.M.  
Well: HALE 8-60 22-23-5  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL #3

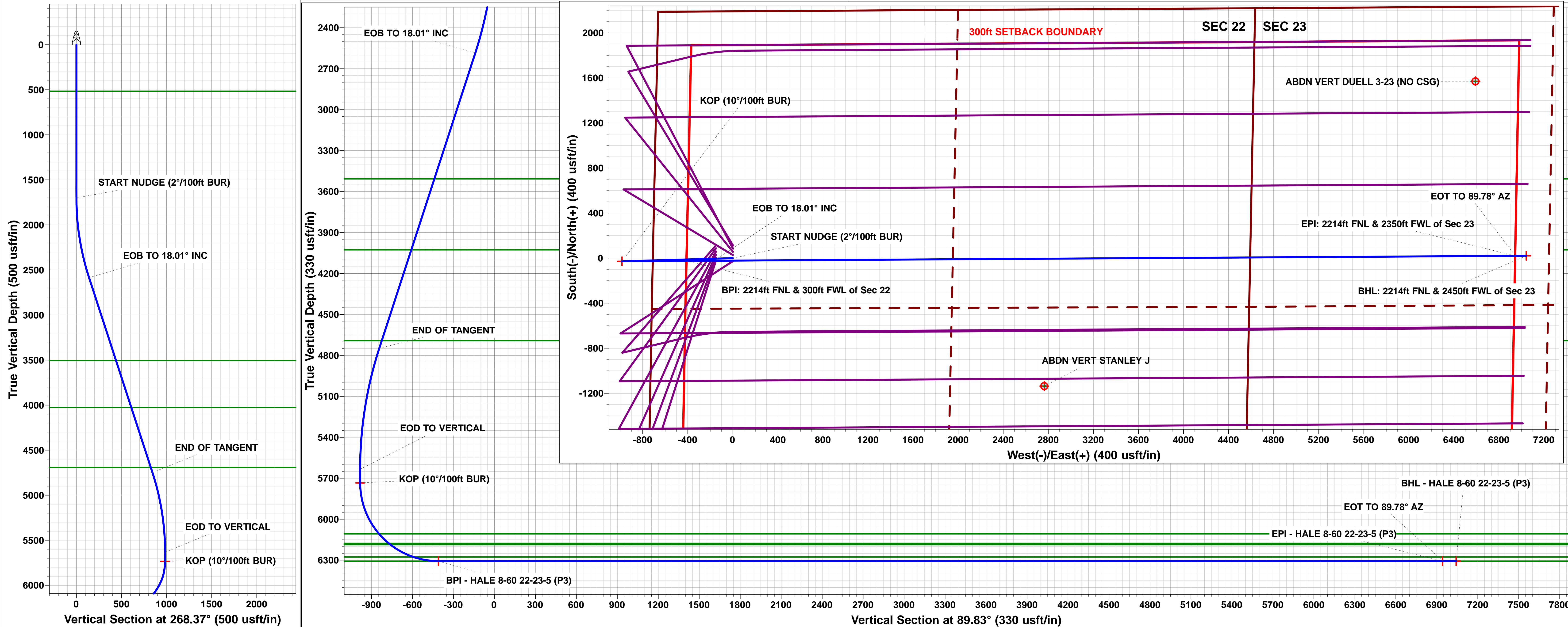
ANNOTATIONS									
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Dep	Annotation	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 2192ft FNL & 710ft FWL of Sec 22	
1700.00	1700.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)	
2585.76	2600.52	18.01	268.37	-3.98	-140.32	-140.33	140.37	EOB TO 18.01° INC	
4748.08	4874.25	18.01	268.37	-23.92	-843.04	-843.11	843.38	END OF TANGENT	
5633.84	5774.76	0.00	268.37	-27.90	-983.36	-983.44	983.76	EOD TO VERTICAL	
5733.84	5874.76	0.00	0.00	-27.90	-983.36	-983.44	983.76	KOP (10°/100ft BUR)	
6306.80	6774.77	90.00	89.65	-24.40	-410.41	-410.48	1556.72	BPI: 2214ft FNL & 300ft FWL of Sec 22	
6306.80	14127.06	90.00	89.65	20.66	6941.74	6941.77	8909.01	EPI: 2214ft FNL & 2350ft FWL of Sec 23	
6306.80	14131.38	90.00	89.78	20.68	6946.06	6946.09	8913.33	EOT TO 89.78° AZ	
6306.80	14226.96	90.00	89.78	21.05	7041.64	7041.67	9008.90	BHL: 2214ft FNL & 2450ft FWL of Sec 23	

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - HALE 8-60 22-23-5 (P3)	5733.84	-27.90	-983.36	40.649016	-104.087998
BPI - HALE 8-60 22-23-5 (P3)	6306.80	-24.40	-410.41	40.649026	-104.085933
EPI - HALE 8-60 22-23-5 (P3)	6306.80	20.66	6941.74	40.649147	-104.059438
BHL - HALE 8-60 22-23-5 (P3)	6306.80	21.05	7041.64	40.649148	-104.059078



FORMATION TOP DETAILS			
TVDPath	MDPath	Formation	
516.80	516.80	P SHALE (BASE FOX HILLS)	
3506.80	3569.01	PARKMAN	
4026.80	4115.80	SUSSEX	
4691.80	4815.07	SHANNON	
6106.80	6280.89	SHARON SPRINGS SHALE	
6176.80	6381.10	NIOBRARA FORMATION	
6186.80	6397.15	NIOBRARA A CHALK	
6276.80	6588.54	NIOBRARA B CHALK	
6306.80	6774.77	NIOBRARA B LP	

PROPOSED LOCAL COORDINATES:  
SHL: 2192ft FNL & 710ft FWL of Sec 22  
BEGIN PROD INT: 2214ft FNL & 300ft FWL of Sec 22  
END PROD INTERVAL: 2214ft FNL & 2350ft FWL of Sec 23  
BHL: 2214ft FNL & 2450ft FWL of Sec 23



# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well HALE 8-60 22-23-5
<b>Company:</b>	BISON OIL & GAS II, LLC	<b>TVD Reference:</b>	KB 25' @ 4956.80usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4956.80usft
<b>Site:</b>	SW NW SEC. 22 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	HALE 8-60 22-23-5	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #3		

<b>Project</b>	WELD COUNTY, COLORADO (NAD 83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

Site	SW NW SEC. 22 T8N R60W 6th P.M.				
Site Position:		Northing:	1,482,610.76 usft	Latitude:	40.649556
From:	Lat/Long	Easting:	3,392,779.56 usft	Longitude:	-104.084442
Position Uncertainty:	0.00 usft	Slot Radius:	1.10000ft	Grid Convergence:	0.91 °

Well	HALE 8-60 22-23-5					
Well Position	+N/-S	-168.69 usft	Northing:	1,482,442.04 usfi	Latitude:	40.649093
	+E/-W	-3.33 usft	Easting:	3,392,778.92 usfi	Longitude:	-104.084454
Position Uncertainty		0.00 usft	Wellhead Elevation:	usfi	Ground Level:	4,931.80 usft

<b>Wellbore</b>	ORIGINAL WELLBORE				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	30/05/2019	7.65	67.10	52,366

<b>Design</b>	PROPOSAL #3			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	6,306.80	0.00	0.00	89.83

<b>Plan Sections</b>											
MD (usft)	Inc (°)	Azi (°)	Vertical Depth	SS (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100usf)	Turn Rate (°/100usf)	TFO (°)	Target
0.00	0.00	0.00	0.00	-4,956.80	0.00	0.00	0.00	0.00	0.00	0.00	
1,700.00	0.00	0.00	1,700.00	-3,256.80	0.00	0.00	0.00	0.00	0.00	0.00	
2,600.52	18.01	268.37	2,585.76	-2,371.04	-3.98	-140.32	2.00	2.00	0.00	268.37	
4,874.25	18.01	268.37	4,748.08	-208.72	-23.92	-843.04	0.00	0.00	0.00	0.00	
5,774.76	0.00	0.00	5,633.84	677.04	-27.90	-983.36	2.00	-2.00	0.00	180.00	
5,874.76	0.00	0.00	5,733.84	777.04	-27.90	-983.36	0.00	0.00	0.00	0.00	KOP - HALE 8-60 2
6,774.77	90.00	89.65	6,306.80	1,350.00	-24.40	-410.41	10.00	10.00	9.96	89.65	BPI - HALE 8-60 22
14,127.06	90.00	89.65	6,306.80	1,350.00	20.66	6,941.74	0.00	0.00	0.00	-85.52	EPI - HALE 8-60 22
14,131.38	90.00	89.78	6,306.80	1,350.00	20.68	6,946.06	3.00	0.00	3.00	90.04	
14,226.96	90.00	89.78	6,306.80	1,350.00	21.05	7,041.64	0.00	0.00	0.00	0.00	BHL - HALE 8-60 2

## Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well HALE 8-60 22-23-5
<b>Company:</b>	BISON OIL & GAS II, LLC	<b>TVD Reference:</b>	KB 25' @ 4956.80usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4956.80usft
<b>Site:</b>	SW NW SEC. 22 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	HALE 8-60 22-23-5	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #3		

## Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
<b>SHL: 2192ft FNL &amp; 710ft FWL of Sec 22</b>										
0.00	0.00	0.00	0.00	4,956.80	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,856.80	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	4,756.80	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	4,656.80	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	4,556.80	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	4,456.80	0.00	0.00	0.00	0.00	0.00	0.00
<b>PIERRE SHALE (BASE FOX HILLS)</b>										
516.80	0.00	0.00	516.80	4,440.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	4,356.80	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	4,256.80	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	4,156.80	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	4,056.80	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	3,956.80	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	3,856.80	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	3,756.80	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	3,656.80	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	3,556.80	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	3,456.80	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	3,356.80	0.00	0.00	0.00	0.00	0.00	0.00
<b>START NUDGE (2°/100ft BUR)</b>										
1,700.00	0.00	0.00	1,700.00	3,256.80	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	2.00	268.37	1,799.98	3,156.82	-0.05	-1.74	-1.74	2.00	2.00	0.00
1,900.00	4.00	268.37	1,899.84	3,056.96	-0.20	-6.98	-6.98	2.00	2.00	0.00
2,000.00	6.00	268.37	1,999.45	2,957.35	-0.45	-15.69	-15.69	2.00	2.00	0.00
2,100.00	8.00	268.37	2,098.70	2,858.10	-0.79	-27.87	-27.87	2.00	2.00	0.00
2,200.00	10.00	268.37	2,197.47	2,759.33	-1.23	-43.51	-43.51	2.00	2.00	0.00
2,300.00	12.00	268.37	2,295.62	2,661.18	-1.78	-62.58	-62.58	2.00	2.00	0.00
2,400.00	14.00	268.37	2,393.06	2,563.74	-2.41	-85.06	-85.07	2.00	2.00	0.00
2,500.00	16.00	268.37	2,489.64	2,467.16	-3.15	-110.93	-110.94	2.00	2.00	0.00
2,600.00	18.00	268.37	2,585.27	2,371.53	-3.98	-140.16	-140.17	2.00	2.00	0.00
<b>EOB TO 18.01° INC</b>										
2,600.52	18.01	268.37	2,585.76	2,371.04	-3.98	-140.32	-140.33	1.98	1.98	0.00
2,700.00	18.01	268.37	2,680.37	2,276.43	-4.85	-171.06	-171.08	0.00	0.00	0.00
2,800.00	18.01	268.37	2,775.47	2,181.33	-5.73	-201.97	-201.99	0.00	0.00	0.00
2,900.00	18.01	268.37	2,870.57	2,086.23	-6.61	-232.88	-232.89	0.00	0.00	0.00
3,000.00	18.01	268.37	2,965.67	1,991.13	-7.48	-263.78	-263.80	0.00	0.00	0.00
3,100.00	18.01	268.37	3,060.77	1,896.03	-8.36	-294.69	-294.71	0.00	0.00	0.00
3,200.00	18.01	268.37	3,155.87	1,800.93	-9.24	-325.59	-325.62	0.00	0.00	0.00
3,300.00	18.01	268.37	3,250.97	1,705.83	-10.11	-356.50	-356.53	0.00	0.00	0.00
3,400.00	18.01	268.37	3,346.07	1,610.73	-10.99	-387.41	-387.44	0.00	0.00	0.00
3,500.00	18.01	268.37	3,441.17	1,515.63	-11.87	-418.31	-418.35	0.00	0.00	0.00
<b>PARKMAN</b>										
3,569.01	18.01	268.37	3,506.80	1,450.00	-12.47	-439.64	-439.68	0.00	0.00	0.00
3,600.00	18.01	268.37	3,536.27	1,420.53	-12.75	-449.22	-449.26	0.00	0.00	0.00
3,700.00	18.01	268.37	3,631.37	1,325.43	-13.62	-480.13	-480.17	0.00	0.00	0.00
3,800.00	18.01	268.37	3,726.47	1,230.33	-14.50	-511.03	-511.07	0.00	0.00	0.00
3,900.00	18.01	268.37	3,821.57	1,135.23	-15.38	-541.94	-541.98	0.00	0.00	0.00
4,000.00	18.01	268.37	3,916.67	1,040.13	-16.25	-572.85	-572.89	0.00	0.00	0.00
4,100.00	18.01	268.37	4,011.77	945.03	-17.13	-603.75	-603.80	0.00	0.00	0.00
<b>SUSSEX</b>										
4,115.80	18.01	268.37	4,026.80	930.00	-17.27	-608.64	-608.69	0.00	0.00	0.00
4,200.00	18.01	268.37	4,106.87	849.93	-18.01	-634.66	-634.71	0.00	0.00	0.00



# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well HALE 8-60 22-23-5
<b>Company:</b>	BISON OIL & GAS II, LLC	<b>TVD Reference:</b>	KB 25' @ 4956.80usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4956.80usft
<b>Site:</b>	SW NW SEC. 22 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	HALE 8-60 22-23-5	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #3		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,300.00	18.01	268.37	4,201.97	754.83	-18.88	-665.56	-665.62	0.00	0.00	0.00
4,400.00	18.01	268.37	4,297.07	659.73	-19.76	-696.47	-696.53	0.00	0.00	0.00
4,500.00	18.01	268.37	4,392.17	564.63	-20.64	-727.38	-727.44	0.00	0.00	0.00
4,600.00	18.01	268.37	4,487.27	469.53	-21.51	-758.28	-758.34	0.00	0.00	0.00
4,700.00	18.01	268.37	4,582.37	374.43	-22.39	-789.19	-789.25	0.00	0.00	0.00
4,800.00	18.01	268.37	4,677.47	279.33	-23.27	-820.10	-820.16	0.00	0.00	0.00
<b>SHANNON</b>										
<b>4,815.07</b>	<b>18.01</b>	<b>268.37</b>	<b>4,691.80</b>	<b>265.00</b>	<b>-23.40</b>	<b>-824.75</b>	<b>-824.82</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>END OF TANGENT</b>										
<b>4,874.25</b>	<b>18.01</b>	<b>268.37</b>	<b>4,748.08</b>	<b>208.72</b>	<b>-23.92</b>	<b>-843.04</b>	<b>-843.11</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
4,900.00	17.50	268.37	4,772.61	184.19	-24.14	-850.89	-850.96	2.00	-2.00	0.00
5,000.00	15.50	268.37	4,868.49	88.31	-24.95	-879.27	-879.34	2.00	-2.00	0.00
5,100.00	13.50	268.37	4,965.30	-8.50	-25.66	-904.29	-904.37	2.00	-2.00	0.00
5,200.00	11.50	268.37	5,062.92	-106.12	-26.27	-925.92	-925.99	2.00	-2.00	0.00
5,300.00	9.50	268.37	5,161.25	-204.45	-26.79	-944.13	-944.20	2.00	-2.00	0.00
5,400.00	7.50	268.37	5,260.14	-303.34	-27.21	-958.89	-958.97	2.00	-2.00	0.00
5,500.00	5.50	268.37	5,359.50	-402.70	-27.53	-970.20	-970.28	2.00	-2.00	0.00
5,600.00	3.50	268.37	5,459.18	-502.38	-27.75	-978.03	-978.11	2.00	-2.00	0.00
5,700.00	1.50	268.37	5,559.08	-602.28	-27.87	-982.38	-982.46	2.00	-2.00	0.00
<b>EOD TO VERTICAL</b>										
<b>5,774.76</b>	<b>0.00</b>	<b>268.37</b>	<b>5,633.84</b>	<b>-677.04</b>	<b>-27.90</b>	<b>-983.36</b>	<b>-983.44</b>	<b>2.00</b>	<b>-2.00</b>	<b>0.00</b>
5,800.00	0.00	0.00	5,659.08	-702.28	-27.90	-983.36	-983.44	0.00	0.00	0.00
<b>KOP (10°/100ft BUR)</b>										
<b>5,874.76</b>	<b>0.00</b>	<b>0.00</b>	<b>5,733.84</b>	<b>-777.04</b>	<b>-27.90</b>	<b>-983.36</b>	<b>-983.44</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
5,900.00	2.52	89.65	5,759.07	-802.27	-27.90	-982.80	-982.88	10.00	10.00	0.00
6,000.00	12.52	89.65	5,858.08	-901.28	-27.82	-969.73	-969.81	10.00	10.00	0.00
6,100.00	22.52	89.65	5,953.32	-996.52	-27.63	-939.66	-939.74	10.00	10.00	0.00
6,200.00	32.52	89.65	6,041.89	-1,085.09	-27.35	-893.51	-893.58	10.00	10.00	0.00
<b>SHARON SPRINGS SHALE</b>										
<b>6,280.89</b>	<b>40.61</b>	<b>89.65</b>	<b>6,106.80</b>	<b>-1,150.00</b>	<b>-27.06</b>	<b>-845.36</b>	<b>-845.43</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,300.00	42.52	89.65	6,121.10	-1,164.30	-26.98	-832.68	-832.75	10.00	10.00	0.00
<b>NIOBRARA FORMATION</b>										
<b>6,381.10</b>	<b>50.63</b>	<b>89.65</b>	<b>6,176.80</b>	<b>-1,220.00</b>	<b>-26.62</b>	<b>-773.82</b>	<b>-773.89</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
<b>NIOBRARA A CHALK</b>										
<b>6,397.15</b>	<b>52.24</b>	<b>89.65</b>	<b>6,186.80</b>	<b>-1,230.00</b>	<b>-26.54</b>	<b>-761.28</b>	<b>-761.35</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,400.00	52.52	89.65	6,188.54	-1,231.74	-26.53	-759.01	-759.09	10.00	10.00	0.00
6,500.00	62.52	89.65	6,242.17	-1,285.37	-26.01	-674.76	-674.84	10.00	10.00	0.00
<b>NIOBRARA B CHALK</b>										
<b>6,588.54</b>	<b>71.38</b>	<b>89.65</b>	<b>6,276.80</b>	<b>-1,320.00</b>	<b>-25.52</b>	<b>-593.38</b>	<b>-593.45</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,600.00	72.52	89.65	6,280.35	-1,323.55	-25.45	-582.48	-582.55	10.00	10.00	0.00
6,700.00	82.52	89.65	6,301.93	-1,345.13	-24.85	-484.97	-485.04	10.00	10.00	0.00
<b>BPI: 2214ft FNL &amp; 300ft FWL of Sec 22 - NIOBRARA B LP</b>										
<b>6,774.77</b>	<b>90.00</b>	<b>89.65</b>	<b>6,306.80</b>	<b>-1,350.00</b>	<b>-24.40</b>	<b>-410.41</b>	<b>-410.48</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,800.00	90.00	89.65	6,306.80	-1,350.00	-24.24	-385.18	-385.25	0.00	0.00	0.00
6,900.00	90.00	89.65	6,306.80	-1,350.00	-23.63	-285.18	-285.25	0.00	0.00	0.00
7,000.00	90.00	89.65	6,306.80	-1,350.00	-23.02	-185.18	-185.25	0.00	0.00	0.00
7,100.00	90.00	89.65	6,306.80	-1,350.00	-22.41	-85.18	-85.25	0.00	0.00	0.00
7,200.00	90.00	89.65	6,306.80	-1,350.00	-21.80	14.81	14.75	0.00	0.00	0.00
7,300.00	90.00	89.65	6,306.80	-1,350.00	-21.19	114.81	114.75	0.00	0.00	0.00
7,400.00	90.00	89.65	6,306.80	-1,350.00	-20.58	214.81	214.75	0.00	0.00	0.00
7,500.00	90.00	89.65	6,306.80	-1,350.00	-19.97	314.81	314.75	0.00	0.00	0.00
7,600.00	90.00	89.65	6,306.80	-1,350.00	-19.35	414.81	414.75	0.00	0.00	0.00
7,700.00	90.00	89.65	6,306.80	-1,350.00	-18.74	514.80	514.75	0.00	0.00	0.00

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well HALE 8-60 22-23-5
<b>Company:</b>	BISON OIL & GAS II, LLC	<b>TVD Reference:</b>	KB 25' @ 4956.80usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4956.80usft
<b>Site:</b>	SW NW SEC. 22 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	HALE 8-60 22-23-5	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #3		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,800.00	90.00	89.65	6,306.80	-1,350.00	-18.13	614.80	614.75	0.00	0.00	0.00
7,900.00	90.00	89.65	6,306.80	-1,350.00	-17.52	714.80	714.74	0.00	0.00	0.00
8,000.00	90.00	89.65	6,306.80	-1,350.00	-16.91	814.80	814.74	0.00	0.00	0.00
8,100.00	90.00	89.65	6,306.80	-1,350.00	-16.30	914.80	914.74	0.00	0.00	0.00
8,200.00	90.00	89.65	6,306.80	-1,350.00	-15.68	1,014.79	1,014.74	0.00	0.00	0.00
8,300.00	90.00	89.65	6,306.80	-1,350.00	-15.07	1,114.79	1,114.74	0.00	0.00	0.00
8,400.00	90.00	89.65	6,306.80	-1,350.00	-14.46	1,214.79	1,214.74	0.00	0.00	0.00
8,500.00	90.00	89.65	6,306.80	-1,350.00	-13.85	1,314.79	1,314.74	0.00	0.00	0.00
8,600.00	90.00	89.65	6,306.80	-1,350.00	-13.24	1,414.79	1,414.74	0.00	0.00	0.00
8,700.00	90.00	89.65	6,306.80	-1,350.00	-12.62	1,514.79	1,514.74	0.00	0.00	0.00
8,800.00	90.00	89.65	6,306.80	-1,350.00	-12.01	1,614.78	1,614.74	0.00	0.00	0.00
8,900.00	90.00	89.65	6,306.80	-1,350.00	-11.40	1,714.78	1,714.74	0.00	0.00	0.00
9,000.00	90.00	89.65	6,306.80	-1,350.00	-10.79	1,814.78	1,814.74	0.00	0.00	0.00
9,100.00	90.00	89.65	6,306.80	-1,350.00	-10.18	1,914.78	1,914.74	0.00	0.00	0.00
9,200.00	90.00	89.65	6,306.80	-1,350.00	-9.56	2,014.78	2,014.74	0.00	0.00	0.00
9,300.00	90.00	89.65	6,306.80	-1,350.00	-8.95	2,114.77	2,114.74	0.00	0.00	0.00
9,400.00	90.00	89.65	6,306.80	-1,350.00	-8.34	2,214.77	2,214.74	0.00	0.00	0.00
9,500.00	90.00	89.65	6,306.80	-1,350.00	-7.73	2,314.77	2,314.74	0.00	0.00	0.00
9,600.00	90.00	89.65	6,306.80	-1,350.00	-7.11	2,414.77	2,414.74	0.00	0.00	0.00
9,700.00	90.00	89.65	6,306.80	-1,350.00	-6.50	2,514.77	2,514.74	0.00	0.00	0.00
9,800.00	90.00	89.65	6,306.80	-1,350.00	-5.89	2,614.76	2,614.74	0.00	0.00	0.00
9,900.00	90.00	89.65	6,306.80	-1,350.00	-5.28	2,714.76	2,714.73	0.00	0.00	0.00
10,000.00	90.00	89.65	6,306.80	-1,350.00	-4.66	2,814.76	2,814.73	0.00	0.00	0.00
10,100.00	90.00	89.65	6,306.80	-1,350.00	-4.05	2,914.76	2,914.73	0.00	0.00	0.00
10,200.00	90.00	89.65	6,306.80	-1,350.00	-3.44	3,014.76	3,014.73	0.00	0.00	0.00
10,300.00	90.00	89.65	6,306.80	-1,350.00	-2.83	3,114.76	3,114.73	0.00	0.00	0.00
10,400.00	90.00	89.65	6,306.80	-1,350.00	-2.21	3,214.75	3,214.73	0.00	0.00	0.00
10,500.00	90.00	89.65	6,306.80	-1,350.00	-1.60	3,314.75	3,314.73	0.00	0.00	0.00
10,600.00	90.00	89.65	6,306.80	-1,350.00	-0.99	3,414.75	3,414.73	0.00	0.00	0.00
10,700.00	90.00	89.65	6,306.80	-1,350.00	-0.37	3,514.75	3,514.73	0.00	0.00	0.00
10,800.00	90.00	89.65	6,306.80	-1,350.00	0.24	3,614.75	3,614.73	0.00	0.00	0.00
10,900.00	90.00	89.65	6,306.80	-1,350.00	0.85	3,714.74	3,714.73	0.00	0.00	0.00
11,000.00	90.00	89.65	6,306.80	-1,350.00	1.47	3,814.74	3,814.73	0.00	0.00	0.00
11,100.00	90.00	89.65	6,306.80	-1,350.00	2.08	3,914.74	3,914.73	0.00	0.00	0.00
11,200.00	90.00	89.65	6,306.80	-1,350.00	2.69	4,014.74	4,014.73	0.00	0.00	0.00
11,300.00	90.00	89.65	6,306.80	-1,350.00	3.30	4,114.74	4,114.73	0.00	0.00	0.00
11,400.00	90.00	89.65	6,306.80	-1,350.00	3.92	4,214.73	4,214.73	0.00	0.00	0.00
11,500.00	90.00	89.65	6,306.80	-1,350.00	4.53	4,314.73	4,314.73	0.00	0.00	0.00
11,600.00	90.00	89.65	6,306.80	-1,350.00	5.14	4,414.73	4,414.73	0.00	0.00	0.00
11,700.00	90.00	89.65	6,306.80	-1,350.00	5.76	4,514.73	4,514.73	0.00	0.00	0.00
11,800.00	90.00	89.65	6,306.80	-1,350.00	6.37	4,614.73	4,614.73	0.00	0.00	0.00
11,900.00	90.00	89.65	6,306.80	-1,350.00	6.99	4,714.73	4,714.73	0.00	0.00	0.00
12,000.00	90.00	89.65	6,306.80	-1,350.00	7.60	4,814.72	4,814.72	0.00	0.00	0.00
12,100.00	90.00	89.65	6,306.80	-1,350.00	8.21	4,914.72	4,914.72	0.00	0.00	0.00
12,200.00	90.00	89.65	6,306.80	-1,350.00	8.83	5,014.72	5,014.72	0.00	0.00	0.00
12,300.00	90.00	89.65	6,306.80	-1,350.00	9.44	5,114.72	5,114.72	0.00	0.00	0.00
12,400.00	90.00	89.65	6,306.80	-1,350.00	10.05	5,214.72	5,214.72	0.00	0.00	0.00
12,500.00	90.00	89.65	6,306.80	-1,350.00	10.67	5,314.71	5,314.72	0.00	0.00	0.00
12,600.00	90.00	89.65	6,306.80	-1,350.00	11.28	5,414.71	5,414.72	0.00	0.00	0.00
12,700.00	90.00	89.65	6,306.80	-1,350.00	11.90	5,514.71	5,514.72	0.00	0.00	0.00
12,800.00	90.00	89.65	6,306.80	-1,350.00	12.51	5,614.71	5,614.72	0.00	0.00	0.00
12,900.00	90.00	89.65	6,306.80	-1,350.00	13.12	5,714.71	5,714.72	0.00	0.00	0.00
13,000.00	90.00	89.65	6,306.80	-1,350.00	13.74	5,814.70	5,814.72	0.00	0.00	0.00
13,100.00	90.00	89.65	6,306.80	-1,350.00	14.35	5,914.70	5,914.72	0.00	0.00	0.00

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well HALE 8-60 22-23-5
<b>Company:</b>	BISON OIL & GAS II, LLC	<b>TVD Reference:</b>	KB 25' @ 4956.80usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4956.80usft
<b>Site:</b>	SW NW SEC. 22 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	HALE 8-60 22-23-5	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #3		

## Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,200.00	90.00	89.65	6,306.80	-1,350.00	14.97	6,014.70	6,014.72	0.00	0.00	0.00
13,300.00	90.00	89.65	6,306.80	-1,350.00	15.58	6,114.70	6,114.72	0.00	0.00	0.00
13,400.00	90.00	89.65	6,306.80	-1,350.00	16.19	6,214.70	6,214.72	0.00	0.00	0.00
13,500.00	90.00	89.65	6,306.80	-1,350.00	16.81	6,314.70	6,314.72	0.00	0.00	0.00
13,600.00	90.00	89.65	6,306.80	-1,350.00	17.42	6,414.69	6,414.72	0.00	0.00	0.00
13,700.00	90.00	89.65	6,306.80	-1,350.00	18.04	6,514.69	6,514.72	0.00	0.00	0.00
13,800.00	90.00	89.65	6,306.80	-1,350.00	18.65	6,614.69	6,614.72	0.00	0.00	0.00
13,900.00	90.00	89.65	6,306.80	-1,350.00	19.27	6,714.69	6,714.72	0.00	0.00	0.00
14,000.00	90.00	89.65	6,306.80	-1,350.00	19.88	6,814.69	6,814.71	0.00	0.00	0.00
14,100.00	90.00	89.65	6,306.80	-1,350.00	20.49	6,914.68	6,914.71	0.00	0.00	0.00
<b>EPI: 2214ft FNL &amp; 2350ft FWL of Sec 23</b>										
<b>14,127.06</b>	<b>90.00</b>	<b>89.65</b>	<b>6,306.80</b>	<b>-1,350.00</b>	<b>20.66</b>	<b>6,941.74</b>	<b>6,941.77</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>EOT TO 89.78° AZ</b>										
<b>14,131.38</b>	<b>90.00</b>	<b>89.78</b>	<b>6,306.80</b>	<b>-1,350.00</b>	<b>20.68</b>	<b>6,946.06</b>	<b>6,946.09</b>	<b>3.00</b>	<b>0.00</b>	<b>3.00</b>
14,200.00	90.00	89.78	6,306.80	-1,350.00	20.95	7,014.68	7,014.71	0.00	0.00	0.00
<b>BHL: 2214ft FNL &amp; 2450ft FWL of Sec 23</b>										
<b>14,226.96</b>	<b>90.00</b>	<b>89.78</b>	<b>6,306.80</b>	<b>-1,350.00</b>	<b>21.05</b>	<b>7,041.64</b>	<b>7,041.67</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

## Formations

MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
516.80	516.80	PIERRE SHALE (BASE FOX HILLS)			
3,569.01	3,506.80	PARKMAN			
4,115.80	4,026.80	SUSSEX			
4,815.07	4,691.80	SHANNON			
6,280.89	6,106.80	SHARON SPRINGS SHALE			
6,381.10	6,176.80	NIOBRARA FORMATION			
6,397.15	6,186.80	NIOBRARA A CHALK			
6,588.54	6,276.80	NIOBRARA B CHALK			
6,774.77	6,306.80	NIOBRARA B LP			

## Plan Annotations

MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.00	0.00	0.00	0.00	SHL: 2192ft FNL & 710ft FWL of Sec 22
1,700.00	1,700.00	0.00	0.00	START NUDGE (2°/100ft BUR)
2,600.52	2,585.76	-3.98	-140.32	EOB TO 18.01° INC
4,874.25	4,748.08	-23.92	-843.04	END OF TANGENT
5,774.76	5,633.84	-27.90	-983.36	EOD TO VERTICAL
5,874.76	5,733.84	-27.90	-983.36	KOP (10°/100ft BUR)
6,774.77	6,306.80	-24.40	-410.41	BPI: 2214ft FNL & 300ft FWL of Sec 22
14,127.06	6,306.80	20.66	6,941.74	EPI: 2214ft FNL & 2350ft FWL of Sec 23
14,131.38	6,306.80	20.68	6,946.06	EOT TO 89.78° AZ
14,226.96	6,306.80	21.05	7,041.64	BHL: 2214ft FNL & 2450ft FWL of Sec 23